UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,459	07/29/2003	Guogen Zhang	SVL920030024US1	7326

22462 7590 02/08/2007		EXAMINER
GATES & COOPER LLP		ADAMS, CHARLES D
HOWARD HUGHES CENTER		
6701 CENTER DRIVE WEST, SUITE 1050		ART UNIT PAPER NUMBER
LOS ANGELES, CA 90045		2164

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

	Application No.	Applicant(s)
Office Action Summary	10/629,459	ZHANG ET AL.
	Examiner	**Art Unit**	
	Charles D. Adams	2164	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>16 November 2006</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-9</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-9</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Remarks

1.   In response to communications filed on 16 November 2006, claims 1, 3-4, 6-7,

and 9 are amended. Claims 1-9 are pending in the application.

Claim Rejections - 35 USC § 101

2.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3.   Claims 1-9 rejected under 35 U.S.C. 101 because the claims lack a practical

application. To have a practical application, the claims must have a concrete, useful,

and tangible result. In this case, the claims lack a tangible result. Though a query

execution plan is being generated, there is nothing being done with this query execution

plan. There is no output or storing of data from optimizing the query.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Cochrane et al. (US Patent 5,963,936) in view of Galindo-Legaria et al. (US Patent

7,010,524).

        As to claim 1, Cochrane et al. teaches a method of optimizing a query in a

computer system, the query being performed by the computer system to retrieve data

from a database stored on the computer system (see Abstract), the method comprising:

        (a) during compilation of the query, maintaining a GROUP BY clause with one or

more GROUPING SETS, ROLLUP or CUBE operations in its original form until after

query rewrite (see column 7, lines 26-30, and column 7, lines 44-48. The "query parser

lexes, parses, and semantically checks a query, producing an internal representation

that is rewritten". Therefore, the query is kept in its original form as an internal

representation. Once it is rewritten, it is no longer in its original form); and

        (b) at a later stage of query compilation, translating the GROUP BY clause with

the GROUPING SETS, ROLLUP, or CUBE operations into a plurality of levels having

one or more grouping sets (see 8:26-42, Figure 7. This step occurs after the step listed

above) comprised of grouping columns (see 11:62-12:15. The GROUP BY sets are

comprised of columns a, b, x, and y),

        Cochrane et al. does not teach generating a query execution plan with a super

group block having an array of grouping sets, wherein each pointer points to a linked list

representing grouping sets for a particular level.

Galindo-Legaria et al. teaches generating a query execution plan with a super

group block (see 5:25-34. The data structure storing the alternative plans) having an

array of grouping sets (see 5:25-34), wherein each pointer points to a linked list

representing grouping sets for a particular level (see 5:25-34, 5:56-63 and Figure 3.

There are lists of 'groups' connected by links and pointers).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to have modified Cochrane et al. by the teaching of

Galindo-Legaria et al., since Galindo-Legaria et al. teaches that "there are situations

where it is desirable to obtain information about execution plans in addition to the one

chosen by the optimizer for execution. In a product-development setting, for example,

the ability to generate and test a large number of candidate plans for the same query is

useful in designing, tuning, and checking the large number of components in a search

engine, especially in its optimizer subsystem" (see 1:45-52).

As to claim 2, Cochrane et al. as modified teaches further comprising:

(1) at query execution time, dynamically determining a grouping sequence for the

GROUP BY clause with the GROUPING SETS, ROLLUP or CUBE operations based on

intermediate grouping sets, in order to optimize the grouping sets sequence (see

Cochrane et al. 8:26-42, Figure 7).

As to claim 3, Cochrane et al. as modified teaches wherein the dynamically

determining step further comprises (1) performing a GROUP BY for a base grouping set

and then optimizing execution of the grouping sets sequence by selecting a grouping set having lowest cardinality from a previous one of the levels as an input to a grouping set on a next one of the levels (see 11:43-47. The GROUP BYs "are stacked from greatest to least cardinality". There is only one grouping set per level. It is inherent, then, that the chosen grouping set sequence from a previous one of the levels will be the smallest one on its level), and (2) performing a UNION ALL operation on the grouping sets (see 11:47-49 and Figure 7. "The base group by and all the GROUP BYs for ROLLUP1 are unioned together. If all of the GROUP BYs are unioned together, then it is functionally equivalent to a UNION ALL").

As to claim 4, Cochrane et al. teaches a computer-implemented apparatus for optimizing a query, the query being performed to retrieve data from a database, the apparatus comprising:

(a) a computer system;

(b) logic, performed by the computer system, for

(1) during compilation of the query, maintaining a GROUP BY clause with one or more GROUPING SETS, ROLLUP or CUBE operations in its original form until after query rewrite (see column 7, lines 26-30, and column 7, lines 44-48. The "query parser lexes, parses, and semantically checks a query, producing an internal representation that is rewritten". Therefore, the query is kept in its original form as an internal representation. Once it is rewritten, it is no longer in its original form); and

(2) at a later stage of query compilation, translating the GROUP BY clause
with the GROUPING SETS, ROLLUP, or CUBE operations into a plurality of levels
having one or more grouping sets (see 8:26-42, Figure 7. This step occurs after the step
listed above) comprised of grouping columns (see 11:62-12:15. The GROUP BY sets
are comprised of columns a, b, x, and y),

Cochrane et al. does not teach generating a query execution plan with a super
group block having an array of pointers, wherein each pointer points to a linked list
representing grouping sets for a particular level.

Galindo-Legaria et al. teaches generating a query execution plan with a super
group block having an array of pointers (see 5:25-34. The data structure storing the
alternative plans), wherein each pointer points to a linked list representing grouping sets
for a particular level (see 5:25-34, 5:56-63 and Figure 3. There are lists of 'groups'
connected by links and pointers).

Therefore, it would have been obvious to one of ordinary skill in the art at the
time the invention was made to have modified Cochrane et al. by the teaching of
Galindo-Legaria et al., since Galindo-Legaria et al. teaches that "there are situations
where it is desirable to obtain information about execution plans in addition to the one
chosen by the optimizer for execution. In a product-development setting, for example,
the ability to generate and test a large number of candidate plans for the same query is
useful in designing, tuning, and checking the large number of components in a search
engine, especially in its optimizer subsystem" (see 1:45-52).

As to claim 5, see the argument in regards to claim 2 above.

As to claim 6, see the argument in regards to claim 3 above.

As to claim 7, <u>Cochrane et al</u>. teaches an article of manufacture embodying logic for performing a method for optimizing a query, the query being performed by a computer system to retrieve data from a database stored in a data storage device coupled to the computer system (see Abstract), the method comprising:

(a) during compilation of the query, maintaining a GROUP BY clause with one or more GROUPING SETS, ROLLUP or CUBE operations in its original form until after the query rewrite (see column 7, lines 26-30, and column 7, lines 44-48. The "query parser lexes, parses, and semantically checks a query, producing an internal representation that is rewritten". Therefore, the query is kept in its original form as an internal representation. Once it is rewritten, it is no longer in its original form);; and

(b) at a later stage of query compilation, translating the GROUP BY clause with the GROUPING SETS, ROLLUP or CUBE operations into a plurality of levels having one or more grouping sets (see 8:26-42, Figure 7. This step occurs after the step listed above) comprised of grouping columns (see 11:62-12:15. The GROUP BY sets are comprised of columns a, b, x, and y)

<u>Cochrane et al</u>. does not teach generating a query execution plan with a super group block having an array of pointers, wherein each pointer points to a linked list representing grouping sets for a particular level.

Galindo-Legaria et al. teaches generating a query execution plan with a super group block having an array of pointers (see 5:25-34. The data structure storing the alternative plans), wherein each pointer points to a linked list representing grouping sets for a particular level (see 5:25-34, 5:56-63 and Figure 3. There are lists of 'groups' connected by links and pointers).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Cochrane et al. by the teaching of Galindo-Legaria et al., since Galindo-Legaria et al. teaches that "there are situations where it is desirable to obtain information about execution plans in addition to the one chosen by the optimizer for execution. In a product-development setting, for example, the ability to generate and test a large number of candidate plans for the same query is useful in designing, tuning, and checking the large number of components in a search engine, especially in its optimizer subsystem" (see 1:45-52).

As to claim 8, see the rejection in regards to claim 2 above.

As to claim 9, see the rejection in regards to claim 3 above.

Response to Arguments

6.   Applicant's arguments filed 16 November 2006 have been fully considered but they are not persuasive.

Applicant argues that the combination of <u>Cochrane et al</u>. and <u>Galindo-Legaria et al</u>. does not "maintain the GROUP BYs in their original form until after query rewrite". This argument is not correct. <u>Cochrane et al</u>., in column 8, lines 26-30, teaches "generally, the query parser lexes, parses, and semantically checks a query, producing an internal representation (a "query graph model") that is rewritten and submitted to the optimizer which generates an optimized query execution plan". The internal representation is "maintained" until it is rewritten. Once the query is rewritten, it is "after query rewrite". As the internal representation is rewritten, it is no longer "maintained".

Applicant argues that the structure in <u>Galindo-Legaria et al</u>. has nothing to do with "grouping sets comprised of grouping columns". In response to this argument, Examiner notes that <u>Cochrane et al</u>. teaches "grouping sets comprised of grouping columns".

Conclusion

7.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles D. Adams whose telephone number is (571) 272-3938. The examiner can normally be reached on 8:30 AM - 5:00 PM, M - F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Rones can be reached on (571) 272-4085. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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